Genetically Engineered Alfalfa

Issue

Genetically Engineered (GE) alfalfa has a high risk of cross contaminating conventional alfalfa crops due to seed escape and cross-pollination. Due to alfalfa's perennial nature, significant barriers exist to fully isolating alfalfa seeds. Key emerging markets maintain zero-tolerance policies towards the import of crops and seeds which are contaminated by GE alfalfa. This poses a serious threat to the province's forage seed exports and feed supplements.

Background

Alberta is a valuable producer of Canada's alfalfa crop, comprising over 30% of the country's total alfalfa output with 2016 exports from Alberta valued at over $28.5 million. Alberta's alfalfa industry plays a critical role both in producing direct exports and in supporting other agriculture industries including livestock[1].

Genetically Engineered (GE) alfalfa crops were approved for food, feed and environmental release by the Canadian Government in 2005[2]. GE alfalfa is the first significant perennial plant to be genetically engineered and introduced into the Western Canadian environment that is naturally cross-pollinated by insects and grows wild. Current strains of GE alfalfa include traits making them resistant to the glyphosate herbicide Roundup. One strain also includes traits which permit a longer growing season, resulting in higher yields and potentially improve its use as feedstock, particularly for dairy livestock[3]

While Canadian regulators have approved GE alfalfa in Canada, our foreign export markets have varying tolerance for GE technology. For example, the European Union and China have zero-tolerance policies for any products containing GE technology. In 2016, these countries were the destination for 7.7% of Alberta's total alfalfa seed exports (Over $1.7 million). The United States, conversely, imports 84.3% ($18.80 million) of Alberta's alfalfa seed exports and 100% ($1.55 million) of its hay exports and has fully approved all current strains of GM alfalfa for import and production[4].

Given the potential growth of markets such as the EU and China for forage export, the presence of GE alfalfa in Canadian hay exports could potentially put an end to export markets for Canadian grass and

[1] Statistics Canada and US Census Bureau. (2018). *Trade Data Online Database*. Retrieved January 30, 2018 from the Innovation, Science, and Economic Development Canada website.
[2] Canadian Seed Trade Organization. (2016). *2016 Coexistance Plan for Alfalfa Hay in Western Canada*. Retrieved January 30, 2018 from the Canadian Seed Trade Organization website.
[3] Mark McCaslin. (6 May, 2016). *What is lignin? How does it impact alfalfa quality and yield?* Retrieved January 30, 2018 from Progressive Dairyman website.
[4] Statistics Canada and US Census Bureau. (2018). *Trade Data Online Database*. Retrieved January 30, 2018 from the Innovation, Science, and Economic Development Canada website.

forage seed growers. In 2014, China blacklisted three American hay exporters and rejected hundreds of container loads of hay due to the detection of Roundup Ready alfalfa.[5]

Given its perennial and transmittable nature, GE alfalfa contamination is likely to occur if it is introduced into Alberta. Currently, no GE alfalfa seed has been sold in the Province. Conventional alfalfa can be contaminated by GE alfalfa in several ways including cross-pollination by insects and seed-escape (contamination of seed from adjacent farms and stands by wind and seed spillage during planting, harvest and transport).

Alfalfa is pollinated primarily by leafcutter bees but also by honeybees, wild bees and other native pollinators that can travel great distances and have unpredictable ranges. Cross-pollination occurs in nature when pollinating insects inadvertently transfer pollen from one plant to another while gathering nectar. Since perennial plants such as alfalfa are capable of flowering multiple times per year, the risk of genetic contamination by cross-pollination is significantly higher than annual crops.

In 2016, the Canadian Seed Trade Association released a co-existence plan for alfalfa hay in Western Canada[6]. This document outlines the details of the risks of GE alfalfa and identifies best practices to mitigating and minimizing cross-contamination. While GE crops and GE technology are widely supported among Alberta's forage and hay producers, several industry associations[7] have noted that a ban on GM alfalfa sales into Western Canada should be put in place until these key destination markets change their import policies.

The Alberta Chambers of Commerce recommends the Government of Alberta:

1. Work with stakeholders to determine how to commercialize new Genetically Engineered Alfalfa to best access both organic and conventional alfalfa producer markets
2. Collaborate with stakeholders on the development of markets for Genetically Engineered Alfalfa.
3. Continue educating consumers on the benefits of Genetic Engineering as a breeding process for modern agriculture.
4. Prevent the introduction of genetically modified/engineered alfalfa to the province of Alberta until there is a marketplace and consumer acceptance in Alberta's export markets

The Alberta Chambers of Commerce recommends the Government of Canada:

5. Work to reduce regulatory prohibition of Genetically Engineered crops and technology in export markets through trade agreements.

[5] Mary MacArthur. (28 November, 2014). *Roundup Ready in alfalfa exports 'catastrophic'*. Retrieved January 30, 2018 from the Western Producer website.

[6] Canadian Seed Trade Organization. (2016). *2016 Coexistance Plan for Alfalfa Hay in Western Canada*. Retrieved January 30, 2018 from the Canadian Seed Trade Organization website.

[7] Most notably the Alberta Forage Industry Network and the National Farmers Union